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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/082,228 | 02/26/2002 | Satoshi Tatsuura | 106200.01 | 4600 |

7590 12/08/2004

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| EXAMINER | |
|---|---|
| WONG, EDNA | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1753 | |

DATE MAILED: 12/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 10/082,228 | TATSUURA ET AL. |
| | Examiner | Art Unit |
| | Edna Wong | 1753 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *30-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *30-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/571,864.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

### *Continued Examination Under 37 CFR 1.114*

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 26, 2004 has been entered.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

I. Claims **30-38** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Melcher et al.** (US Patent No. 4,217,183) in combination with **Ellingson et al.** (US Patent No. 5,296,960).

Melcher teaches an apparatus for electrodeposited film formation comprising:

(i) an electrolyte solution bath **10** holding:

(a) an electrolyte solution **12** containing ions to constitute an electrodeposited film (col. 4, lines 31-32; col. 7, claim 3; and col. 8, claim 7), and

(b) an object to be treated **16** of which at least the surface permits **18** generation of charged particles when irradiated with a laser beam and onto which the electrodeposited film is to be deposited (col. 3, lines 4-18; and col. 4, lines 32-36);

(ii) a laser **22** having a pulse width (= from the mechanical light chopper **28**) [col. 4, lines 17-24] and which irradiates at least part of the object to be treated positioned in the electrolyte solution to thereby excite electrons in the laser-irradiated part and form the electrodeposited film at the laser-irradiated part (col. 2, line 65 to col. 4, line 63; and Figs. 1 and 2).

The apparatus is further provided with an opposite electrode **20** (= anode) held separated from the object to be treated **14** in the electrolyte solution **12** (col. 3, lines 20-23; and Figs. 1 and 2); and a power source **31** for applying a bias voltage between the object to be treated **16** and the opposite electrode **20** (col. 4, lines 25-30; and Figs. 1 and 2).

The electrolyte solution contains at least one plating metal selected from the group consisting of Cu, Pt, Zn, Ni, Cd, Cr, Sn, Au, Ag, Rh, Ru, Pb, Ti, Pd, Co, B, Ge, Al, In, Ir, Mo, W, V and Ta (= W, Mo, Ni, Cu or Au) [col. 7, claim 3; and col. 8, claim 7].

The electrolyte solution contains at least one of Cu, Pt, Zn or Ni (= Cu or Ni) [col. 8, claim 7).

The object to be treated comprises a metal selected from the group consisting of object to be treated comprises a metal selected from the group consisting of Au, Cu, Pt,

Zn, Cd, CrSnAu, AgRh, Ru, Pb, TiPd, Co, B, Ge, Al, In, Ir, Mo, W, V, Ta, Ni, Sn and alloys thereof (= W, Mo, Ni, or Cu) [col. 3, lines 7-11].

The object to be treated comprises at least one of Au, Cu, Pt or Zn (= Cu) [col. 3, lines 9-11].

The electrolyte solution is an aqueous solution (= $H_2O$) [col. 4, line 65 to col. 6, Examples].

Melcher does not teach wherein the laser is a mode-locked laser.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Melcher with wherein the laser is a mode-locked laser because Melcher teaches that when electromagnetic radiation in the *visible range* is employed, it can be generated from a carbon arc but preferably a laser light source such as a continuous multimode or single mode argon laser or a krypton tunable laser is also *an acceptable light source*. The intensity of the light in all cases should be sufficient to provide a beam **22** with an intensity preferably between about $10^2$ to $10^6$ W/cm$^2$ (col. 3, lines 40-50). The upper limit should be chosen so as to avoid thermal transformations of the structure of the cathode **14**. In general, this will limit the maximum power input to about $10^6$ W/cm$^2$ for exposures longer than microseconds and proportionally *higher powers for shorter pulse durations* (col. 3, lines 57-62).

This teaching suggests that an acceptable light source would have generated higher powers (higher than $10^6$ W/cm$^2$) for shorter pulse durations in the visible range. Thus, it is well within the skill of the artisan to have employed a mode-locked laser because a mode lock laser would have generated the higher powers for shorter pulse durations in the visible range as taught by Ellingson (col. 1, lines 27-38; col. 2, lines 3-28; and col. 6, lines 4-26).

The selection of old parts to operate in new environments in order to achieve the same results was held to have been obvious. *In re Ross* 105 USPQ 237. And the substitution of known equivalent structures was held to have been obvious. *In re Ruff* 118 USPQ 343 (CCPA 1958).

As to wherein the pulse width is less than a picosecond, Ellingson teaches laser pulses in the femtosecond (fs) time domain (col. 1, lines 27-38; col. 2, lines 3-28; and col. 6, lines 4-26).

As to wherein said mode-locked is a mode-locked titanium sapphire laser, Ellingson teaches a mode-locked Ti:sapphire laser (col. 1, lines 27-38; col. 2, lines 3-28; and col. 6, lines 4-26).

As to wherein said aqueous solution contains 2 to 18% by weight plating metal, the concentration of plating metal is a result-effective variable and one skilled in the art

has the skill to calculate the concentration that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Melcher teaches 200 gm $CuSO_4 \cdot 5H_2O$ (col. 6, Example V).

Furthermore, the aqueous solution is a material worked upon. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining the patentability of the apparatus claim (see MPEP 2115).

**II.** Claims **39-46** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Melcher et al.** (US Patent No. 4,217,183) in combination with **Ellingson et al.** (US Patent No. 5,296,960).

Melcher teaches an apparatus for electrodeposited film formation comprising:

(i) an electrolyte solution bath **10** holding:

(a) an electrolyte solution **12** containing ions to constitute an electrodeposited film (col. 4, lines 31-32; col. 7, claim 3; and col. 8, claim 7), and

(b) an object to be treated **16** of which at least the surface permits **18** generation of charged particles when irradiated with a laser beam and onto which the electrodeposited film is to be deposited (col. 3, lines 4-18; and col. 4, lines 32-36);

(ii) a pulse laser **22** with an electric field and having a pulse width (= from the

mechanical light chopper **28**) [col. 4, lines 17-24] and which irradiates at least part of the object to be treated positioned in the electrolyte solution to thereby excite electrons in the laser-irradiated part and form the electrodeposited film at the laser-irradiated part (col. 2, line 65 to col. 4, line 63; and Figs. 1 and 2).

The apparatus is further provided with an opposite electrode **20** (= anode) held separated from the object to be treated **14** in the electrolyte solution **12** (col. 3, lines 20-23; and Figs. 1 and 2); and a power source **31** for applying a bias voltage between the object to be treated **16** and the opposite electrode **20** (col. 4, lines 25-30; and Figs. 1 and 2).

The electrolyte solution contains at least one plating metal selected from the group consisting of Cu, Pt, Zn, Ni, Cd, Cr, Sn, Au, Ag, Rh, Ru, Pb, Ti, Pd, Co, B, Ge, Al, In, Ir, Mo, W, V and Ta (= W, Mo, Ni, Cu or Au) [col. 7, claim 3; and col. 8, claim 7].

The electrolyte solution contains at least one of Cu, Pt, Zn or Ni (= Cu or Ni) [col. 8, claim 7).

The object to be treated comprises a metal selected from the group consisting of object to be treated comprises a metal selected from the group consisting of Au, Cu, Pt, Zn, Cd, CrSnAu, AgRh, Ru, Pb, TiPd, Co, B, Ge, Al, In, Ir, Mo, W, V, Ta, Ni, Sn and alloys thereof (= W, Mo, Ni, or Cu) [col. 3, lines 7-11].

The object to be treated comprises at least one of Au, Cu, Pt or Zn (= Cu) [col. 3, lines 9-11].

The electrolyte solution is an aqueous solution (= $H_2O$) [col. 4, line 65 to col. 6,

Examples].

Melcher does not teach wherein the electric field is in the order of tens of $GW/cm^2$.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Melcher with wherein the electric field is in the order of tens of $GW/cm^2$ because Melcher teaches that the intensity of the light in all cases should be sufficient to provide a beam **22** with an intensity preferably between *about $10^2$ to $10^6$ $W/cm^2$* (col. 3, lines 40-50). The upper limit should be chosen so as to avoid thermal transformations of the structure of the cathode **14**. In general, this will limit the maximum power input to about $10^6$ $W/cm^2$ for exposures longer than microseconds and proportionally *higher powers for shorter pulse durations* (col. 3, lines 57-62).

This teaching suggests that higher powers (higher than $10^6$ $W/cm^2$) would have been chosen for shorter pulse durations. One having ordinary skill in the art has the skill to employ the appropriate light source that would have provided such power to have produced the desired shorter pulse duration. An appropriate light source would have been the argon-pumped mode-locked Ti:sapphire laser which would have provided for high-repetition-rate femtosecond pulses, tunable in the visible range, with high average power, *short pulse width*, excellent spatial mode quality, high peak power and excellent

stability using a shorter wavelength pump beam as taught by Ellingson (col. 6, lines 4-26).

The selection of old parts to operate in new environments in order to achieve the same results was held to have been obvious. *In re Ross* 105 USPQ 237. And the substitution of known equivalent structures was held to have been obvious. *In re Ruff* 118 USPQ 343 (CCPA 1958).

As to wherein the electric field is in the order of tens of $GW/cm^2$, it is deemed that the femtosecond laser disclosed by Ellingson would have been capable of producing an electric field that is in the order of tens of $GW/cm^2$, unless proven otherwise.

As to wherein the pulse width is less than a picosecond, Ellingson teaches laser pulses in the femtosecond (fs) time domain (col. 1, lines 27-38; col. 2, lines 3-28; and col. 6, lines 4-26).

As to wherein said aqueous solution contains 2 to 18% by weight plating metal, the concentration of plating metal is a result-effective variable and one skilled in the art has the skill to calculate the concentration that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Melcher teaches 200 gm $CuSO_4 \cdot 5H_2O$ (col. 6, Example V).

Furthermore, the aqueous solution is a material worked upon. Expressions

relating the apparatus to contents thereof during an intended operation are of no significance in determining the patentability of the apparatus claim (see MPEP 2115).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 3:30 pm, Flex Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edna Wong
Primary Examiner
Art Unit 1753

EW
December 6, 2004